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April 5, 2004

VIA EXPRESS MAIL NO. EV392153405US

Mail Stop: Appeal Brief - Patents
Commissioner for Patents
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Re: Applicant: Hey, John
Serial No.: 09/682,659
Filed: October 3, 2001
For: SYSTEM FOR STEREOGRAPHIC VIEWING OF AN IMAGE
Examiner: Fineman, Lee A.
Group: 2872
Docket No.: 16954-00007

Dear Sir:

Enclosed is an Appeal, in triplicate, and a check in the amount of \$165.00 for the filing fee.

If for any reason this Appeal Brief is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned in Westborough, Massachusetts (508) 898-1501.

If any payment during prosecution is found to be insufficient or if any overpayment is found, please charge any deficiency or credit any overpayment to my deposit account number 50-1582. A copy of this letter is enclosed for use by the Finance Branch in the event that it is necessary to make any charge or credit to my deposit account.

Kindly acknowledge receipt of the foregoing by returning the enclosed self-addressed postcard.

Very truly yours,



Brian M. Blingman

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Enclosures

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Sandra L. Kopacz
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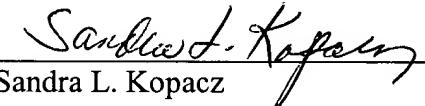


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Sandra L. Kopacz

APPEAL BRIEF

This brief (submitted in triplicate) is filed in support of Appellant's appeal from the decision of the Examiner dated September 8, 2003, rejecting all pending claims 14-19, 21-26, 41 and 42.

Appellant is a small entity under 37 C.F.R. §1.9 and 1.27. Therefore a check in the amount of \$165.00 for the fee for filing a brief in support of an appeal pursuant to 37 C.F.R. §1.17(c) is enclosed.

I. REAL PARTY IN INTEREST

The real party in interest is Mr. John Hey.

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II. RELATED APPEALS AND INTERFERENCES

To the best of Appellant's knowledge, no other appeals or interferences are pending which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 14-19, 21-26, 41 and 42 are pending in the subject application, and all stand rejected as obvious in light of Craig, US patent no. 4,740,836, in view of Surati, US Patent no. 6,456,339. These are the claims being appealed.

Claims 1-13, 20, 27-40 and 43 have been canceled without prejudice.

Claim 41 was objected to for lack of antecedent basis for "the viewer's perspective".

The specification was objected to for incorrect references to several drawings.

IV. STATUS OF AMENDMENTS

No amendments have been filed subsequent to the final rejection.

V. SUMMARY OF INVENTION

The invention of claims 14-19 and 21-26 is a system for stereoscopic viewing of an image. The system comprises means for displaying upon a generally flat surface a conventional stereoscopic pair of images, proximate but separately from one another. An example of this display is shown in FIG. 1A. Another example is shown in FIG. 2A. The definition of the phrase "conventional stereoscopic pair of images" is found in Section [0024]. Thus, this means results in the display of two images of a single subject representing the perspective of the two different eyes of the viewer.

The invention also comprises an optical device adapted to be placed in front of and proximate to a viewer's eyes. The optical device comprises means for re-angling the optical axis

for at least one eye so that each eye generally targets the center of a respective one of the pair of images. An example is shown in FIG. 2C. See section [0027]. Mirror pair 25 and 26 redirects the nominally horizontal optical axis of the user's right eye up toward the center of upper image 28. Thus, by gazing directly at lower image 27, the user effectively sees both images as if the optical axis of each of the user's eyes was directly at the center of each image. In fact, however, in this case the optical path for the user's right eye is actually at an upward angle, as if the user was looking at the upper image from below its center. This viewing angle results in keystone distortion of the type shown in FIG. 5C (except that in this example the image would be viewed from below rather than above, so that the shape of the trapezoid would be reversed 180° as compared to the shape shown in FIG. 5C). Keystone distortion is described in more detail below.

The invention also comprises means for improving the stereoscopic match between the two images as viewed, by distorting at least one of the images. Examples of such distortion are illustrated in FIGS. 5 and 6 and are described in Sections [0030] through [0035]. Because the optical axis of one or both eyes of the viewer is re-angled by the optical device, the viewing angle can make a conventionally displayed image appear distorted. For example, an image that is rectangular when viewed straight on, as shown in FIG. 5A, appears trapezoidal when viewed from above its center, as shown in FIG. 5C. This is due to the fact that the top of the image is closer to the user's eye than is the bottom of the image, making the image appear trapezoidal, with the larger base of the trapezoid at the top, and the smaller base at the bottom. This distortion will cause the image viewed by one eye to differ from the image viewed by another eye, thus affecting the stereoscopic match between the two images.

The means of this element of claim 14 distorts at least one of the images to improve the stereoscopic match between the two images. An example of the distortion is shown in FIGS. 6B and 6C. FIG. 6B corresponds to FIG. 5C in that it illustrates the keystone distortion that would occur when a rectangular image as shown in FIG. 6A is viewed from above center. An example of the image distortion of the invention is shown in FIG. 6C. This is a reverse-distortion, in which the image resembles a reciprocally keystoned trapezoid (i.e., effectively the reverse of FIG. 6B) as shown in FIG. 6C. When the image of FIG. 6C is viewed from above center, it appears rectangular as shown in FIG. 6D. In the claimed invention, at least one of the images is deliberately distorted to achieve an improvement in the stereoscopic match between the two images.

Claims 41 and 42 are directed to an image display structure that is useful in the invention. The claims are directed at displaying a conventional stereoscopic pair of images with at least one image deliberately distorted prior to display, such as described above. In claim 41, this distortion counteracts distortion caused by the viewer's perspective relative to the image, as described above relative to claim 1. In claim 42, this distortion counteracts image mismatch caused by a viewing device. An example of a distortion introduced by the viewing device is described in Section [0044]. The generalization of the distortion that counteracts both the viewer's perspective (relative to claim 41) and the image-mismatch caused by a viewing device (relative to claim 42) is described Section [0045] with reference to FIG. 10.

VI. ISSUES

1. Whether claims 14-19, 21-26, 41 and 42 are unpatentable under 35 U.S.C. § 103(a) over Craig, US patent no. 4,740,836, in view of Surati, US Patent no. 6,456,339.

2. Whether the combination of these two references made by the Examiner is proper under the law.

VII. GROUPING OF CLAIMS

There are three groups of claims as follows:

Group I comprises independent claim 14 and dependent claims 15-26. The claims in this group do not stand or fall together.

Group II comprises independent claim 41. The claim in this group does not stand or fall with the claims in any other group.

Group III comprises independent claim 42. The claim in this group does not stand or fall with the claims in any other group.

VIII. ARGUMENT

A. Claims 14-19, 21-26, 41 and 42 are not unpatentable over Craig in view of Surati.

The Examiner rejected claims 14-19, 21-26, 41 and 42 under 35 U.S.C. § 103(a) as unpatentable over Craig in view of Surati et al. ("Surati").

Claim 14 has a "means for improving the stereoscopic match between the two images as viewed, by distorting at least one of the images." Neither Craig nor Surati discloses any such means. In order for references to make a claim obvious under 35 U.S.C. § 103, the combination of the references must disclose each element of the claim. The combination of Craig and Surati does not disclose this element of claim 14. Accordingly, the claim must be patentable.

Craig makes no mention of improving the stereoscopic match between two images, and also does not mention distorting at least one image to improve the stereoscopic match between two images. Indeed, Craig does not distort the images for any purpose.

Surati creates a single image from a number of separate projections, each comprising only a portion of the entire image, as shown in Figs. 1 and 2.¹ Surati distorts the entirety of an image, whether it is made from a single projection or more than one projection. With multiple projections, Surati teaches distorting the projections in order to correct for their misalignment. The end result is that the several projections are properly aligned, so that together they create a high-quality, seamless, single image. Surati thus does not propose ANY means for improving a stereoscopic match between two images.

Accordingly, the references as combined by the examiner simply do not either directly or inherently disclose this element of claim 14. And, in order to make any claim obvious, the references as a whole must disclose every element of that claim. As neither reference discloses this means element of claim 14, combining Surati's image distortion with Craig cannot be read as disclosing such element. The claim must therefore be patentable.

Further, the combination of these references in an attempt to recreate the invention of claim 14 is improper under the law. Surati does alter or distort separate image portions, but the alterations improve the image by improving the relative alignment of the several portions of a single image. Thus, if Surati and Craig were combined, the result would be that the Surati technology would seamlessly align the two images of Craig, which would not improve the stereoscopic match of the Craig images. Rather, Craig shows in the figures that a seam is placed between the top and bottom images (see Fig. 2 and column 4, lines 29-32). In fact, then, seamless alignment of the two Craig images using the Surati technique would take away a

¹ Surati also makes a brief mention of distorting a single projection to improve its display (column 9 lines 23-25), but the arguments herein apply whether Surati is used to correct one projection, or a plurality of projections. In either case, Surati corrects one or more portions making up a single image, not the two images of a stereoscopic pair of images.

critical feature of Craig (the seam between the two images), thus actually making the stereoscopic match of Craig worse; the two Craig images would be more perfectly aligned, thus the display would lose the sharp top edge of the bottom image and the sharp bottom edge of the top image. As the combination would negatively affect the result of one reference (Craig), under the law of 35 U.S.C. § 103, the combination is improper.

The clear teachings of the references themselves thus teach away from any combination, making their combination clearly improper under the law of 35 U.S.C. § 103.

To establish obviousness, the differences between the subject matter of the invention and the prior art must be such that the subject matter of the claimed invention, *as a whole*, would have been obvious to someone skilled in the art. (emphasis added) McGinley v. Franklin Sports, Inc., 60 U.S.P.Q.2d 1001, 1007 (Fed. Cir. 2001) and Ruiz v. A.B. Chance Co., 57 U.S.P.Q.2d 1161 (Fed. Cir. 2000), both citing, 35 U.S.C. § 103(a). As a whole, the claimed invention is not obvious, and so is patentable over Craig in view of Surati. In fact, Surati introduces no means not previously widely known and available to Craig, who effectively treats immersive 3-D viewing (which is typically highly-desirable) as practically unobtainable in the context.

The Appellant herein teaches that image distortion to improve the stereoscopic match between two stereoscopic images improves the quality of a stereoscopic image display. Surati has nothing to do with stereoscopic viewing of a pair of images, so would never be looked at to improve Craig's images. Thus, one skilled in the art having knowledge of Craig would never look to Surati for any purpose.

When making any obviousness determination, there must be a suggestion or motivation to modify a prior art reference. “Determining whether there is a suggestion or motivation to modify a prior art reference is one aspect of determining the scope and content of the prior art, a

fact question subsidiary to the ultimate conclusion of obviousness.”” Ruiz v. A.B. Chance, 57 U.S.P.Q.2d at 1167, quoting, Sibia Neurosciences, Inc. v. Cadus Pharma. Corp., 225 F.3d 1349, 1356, 55 U.S.P.Q.2d 1927, 1931 (Fed. Cir. 2000). The suggestion, teaching or reason must come from the prior art itself; it cannot be based on hindsight in view of the claims. McGinley v. Franklin Sports, Inc., 60 U.S.P.Q.2d 1001, 1008 (Fed. Cir. 2001), citing, In re Dembicza, 175 F.3d 994, 999, 50 U.S.P.Q.2d 1769 (Fed. Cir. 1999)“(guarding against falling victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher).”

In any obviousness determination, the patent examiner must determine the scope and content of the prior art, the differences between the prior art and the claims at issue, and the level of ordinary skill in the pertinent art, as established in *Graham v. John Deere*, 383 U.S. 1, 148 U.S.P.Q. 459 (1966). Patentability turns on whether the subject matter as a whole sought to be patented was obvious to one with “ordinary skill in the art to which the subject matter pertains” in light of the prior art. “In determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious.” M.P.E.P. §2141.02, citing, *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 U.S.P.Q. 871 (Fed. Cir. 1983); *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 U.S.P.Q. 698 (Fed. Cir. 1983).

In reference to an obviousness determination, Section 2141 of the Manual of Patent Examining Procedure states the following:

When applying 35 U.S.C. § 103, the following tenets of patent law must be adhered to:

- (1) the claimed invention must be considered as a whole;
- (2) the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;

(3) the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention and

(4) reasonable expectation of success is the standard with which obviousness is determined. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 U.S.P.Q. 182, 187, n.5 (Fed. Cir. 1986).

Furthermore, "[o]bviousness may be not established using hindsight or in view of the teachings or suggestions of the inventor." *Para-Ordnance Manufacturing, Inc. v. SGS Importers International, Inc.*, 73 F.3d 1085, 37 U.S.P.Q.2d 1237 (Fed. Cir. 1995). "To draw on hindsight knowledge of the...invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction--an illogical and inappropriate process by which to determine patentability." *Sensonics, Inc. v. Aerasonic Corp.*, 81 F.3d 1566, 38 U.S.P.Q.2d 1551 (Fed. Cir. 1996). No suggestion or motivation for modifying a reference exists if such a modification would render the invention of the reference unsatisfactory for its intended purposes. *In re Gordon*, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984). Such is the case with Craig. As described above, Craig would be made worse by use of Surati's technique of removing the seam between the images. Accordingly, the combination of Surati with Craig is legally impermissible.

The Examiner's combination of the two references is made without any suggestion in the art to make such combination. Thus, the combination was made using impermissible hindsight. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 10044, 1051-52, 5 U.S.P.Q.2d 1434, 1438 (Fed. Cir. 1988) (it is impermissible to reconstruct the claimed invention from selected pieces of prior art absent some suggestion, teaching or motivation in the prior art to do so); *In re Rouffet*, 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998) ("rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the

patentability of the claimed invention."). The Court of Appeals for the Federal Circuit in Pentec, Inc. v Graphic Controls Corp., 227 U.S.P.Q. 766 (Fed. Cir. 1985), stated that "prior art may not be gathered with the claimed invention in mind". Similarly, in In re Oetiker, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992), the Court noted:

Patent examination is necessarily conducted by hindsight, with complete knowledge of the applicant's invention, and the Courts have recognized the subjective aspects of determining whether an inventor would reasonably be motivated to go to the field in which the examiner found the reference, in order to solve the problem confronting the inventor . . . It is necessary to consider 'the reality of the circumstances', . . . - in other words, common sense - in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor . . . The combination of elements from non-analogous sources, in a manner that reconstructs the applicant's invention only with the benefit of hindsight, is insufficient to present a *prima facia* case of obviousness. 24 U.S.P.Q.2d at 1446.

In the present instance, neither of the references are concerned with deliberately distorting one or both images of a stereoscopic pair in order to improve their stereoscopic match.

The Examiner's impermissible hindsight is evidenced by the Examiner's statement that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a means to deliberately distort at least one image prior to display as suggested by Surati et al. to the system of Craig to improve the performance of the display (column 9, lines 23-25)." (September 8, 2003 final office action; sentence spanning pages 3 and 4). The Examiner has presumed Surati would improve the performance of the Craig display, when in fact it would negatively affect Craig's display. Thus, without impermissible reference to Appellant's disclosure, there is no motivation to combine Surati with Craig.

In addition, stereoscopic image pairs have been known for many years. Yet, no one has ever deliberately distorted one or both images of a stereoscopic image pair in order to improve the stereoscopic match between the images. This in itself is evidence of nonobviousness. Arkie

Lures Inc. v. Gene Larew Tackle Inc., 43 U.S.P.Q.2d 1294, 1297 (Fed. Cir. 1997) (“the years of use of [the prior art], without combining their properties, weighs on the side of unobviousness of the combination.”). When the prior art in question has been widely available for many years to persons skilled in the art without any suggestion to modify or combine, such widely available prior art is itself evidence of nonobviousness. Ruiz v. A.B. Chance, 57 U.S.P.Q.2d at 1168, quoting, Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1577, 1 U.S.P.Q.2d 1593, 1605 (Fed. Cir. 1987)(“[T]hat the elements noted by the court lay about in the prior art available for years to all skilled workers, without, as the court found, suggesting anything like the claimed inventions, is itself evidence of nonobviousness.””).

The Examiner's obviousness rejection is improper because: 1) as a whole the references do not teach or suggest all the limitations of the claims and therefore even a combination of their teachings does not render the Appellant's claims obvious, 2) Surati's image distortion is unsuited to a stereoscopic image pair, and 3) there is no suggestion or motivation expressed in any of the references to modify Craig by distorting one or both of its stereoscopic pair of images.

B. The Appellant's claims 41 and 42 are not unpatentable over Craig in view of Surati et al.

The Examiner rejected claims 41 and 42 under 35 U.S.C. § 103(a) as unpatentable over Craig in view of Surati. As described above, neither reference teaches distortion of at least one image of a stereoscopic pair of images for any reason. Thus, claims 41 and 42 are clearly patentable. Also, for the reasons described above, it is improper under the law to combine the references in order to accomplish Appellant's claimed invention. Accordingly, claims 41 and 42 are patentable over the references.

For the above reasons, the Appellant respectfully submits that all the claims are patentable over the references of record. Allowance is respectfully requested.

Respectfully submitted,



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APPENDIX OF CLAIMS INVOLVED IN APPEAL

14. A system for stereoscopic viewing of an image, comprising:
 - means for displaying upon a generally flat surface a conventional stereoscopic pair of images, proximate but separately from one another;
 - means for improving the stereoscopic match between the two images as viewed, by distorting at least one of the images; and
 - an optical device adapted to be placed in front of and proximate to a viewer's eyes, which device is worn by the viewer or held by the viewer as though worn, and comprising means for re-angling the optical axis for at least one eye, so that each eye generally targets the center of a respective one of the pair of images.
15. The system of claim 14, in which the images are arranged one above the other.
16. The system of claim 14, in which the optical axis for exactly one eye is reangled.
17. The system of claim 16, in which the images are arranged one above the other.
18. The system of claim 14, in which at least one image is deliberately distorted prior to display, to counteract distortion caused by the viewer's perspective relative to the image.
19. The system of claim 14, in which at least one image is deliberately distorted prior to display, to counteract image-mismatch caused by the viewing-device.
21. The system of claim 14, wherein said images are displayed upon a surface large enough to subtend an immersive portion of the viewer's visual field.
22. The system of claim 14, wherein said images comprise the display for a video-game.
23. The system of claim 14, wherein said images comprise a televised display of still- or motion-picture images.
24. The system of claim 14, wherein said images comprise a computer-graphics display of

still- or motion-picture images.

25. The system of claim 14, wherein said optical device comprises a pair of mirrors for each re-angled eye.

26. The system of claim 14, wherein said optical device comprises a prism for each re-angled eye.

41. An image display structure for displaying upon a generally flat surface, comprising:
a conventional stereoscopic pair of images, the images proximate but separate from one another, wherein at least one image is deliberately distorted prior to display, to counteract distortion caused by the viewer's perspective relative to the image.

42. An image display structure for displaying upon a generally flat surface, comprising:
a conventional stereoscopic pair of images, the images proximate but separate from one another, wherein at least one image is deliberately distorted prior to display, to counteract image-mismatch caused by a viewing-device.